NATURAL FRESHWATER SPRINGS OF THE BALLONA WATERSHED

Historical Flow Rates and Hydrological Analysis

Tongva, Spanish Colonial, and Modern Era Documentation
With Estimated Freshwater Contributions

January 2026 — Research Report

Executive Summary

This report documents the natural freshwater springs that historically fed the Ballona Watershed in western Los Angeles County. The 130-square-mile watershed once contained **45 mapped springs** (per the 2011 SCCWRP Historical Ecology Study) that provided perennial flow to Ballona Creek and its tributaries. Approximately **70% of these springs** were concentrated in the Santa Monica Mountain foothills, clustered from the Beverly Hills area to Franklin Canyon, where they stopped abruptly due to geological conditions. Today, only one major spring—Kuruvungna Springs at University High School—remains actively flowing above ground with documented discharge.

Critical Finding: The estimated historical combined freshwater contribution from the major documented springs was approximately **3.5 to 7.5 million gallons per day**. Current spring-fed freshwater contribution has declined to approximately **25,000 to 56,000 gallons per day**—a reduction of over **98%**. A 2011 hydrological study confirmed that only approximately 2% of Ballona Creek's flow now comes from natural springs, with 98% consisting of urban runoff.

Key Statistics

Parameter	Historical (1850-1890)	Current (2026)
Springs Mapped	45 documented	1 confirmed active
Estimated Daily Flow	3.5–7.5 million gallons	25,000–56,000 gallons
Flow Rate	~2,400–5,200 gpm	~17–39 gpm
% of Creek Flow	8–12% (dry season)	~2%
Wetland Acreage Supported	14,149 acres	<500 acres

Summary: Spring Flow Rate Analysis

The following table presents estimated historical and current flow rates for the major spring systems of the Ballona Watershed. Historical estimates are derived from 19th-century engineering surveys, congressional reports, and California miner's inch measurements.

Conversion: 1 California miner's inch = 11.22 gallons per minute = 16,157 gallons per day

Main Flow Rate Table

Spring System	Historical Flow (gal/day)	Current Flow (gal/day)	Historical (1000 gal/day)	Status
Kuruvungna Springs	22,000–56,000	22,000–56,000	22–56	🟢 **ACTIVE**
Centinela Springs †	323,000–1,616,000	0	323–1,616	🔴 EXTINCT
Rodeo de las Aguas *	500,000–1,500,000	0	500–1,500	🔴 EXTINCT
La Cienega Complex *	500,000–1,000,000	0	500–1,000	🔴 EXTINCT
La Brea Springs *	200,000–400,000	0	200–400	🔴 EXTINCT
Franklin Canyon *	75,000–100,000	Unknown	75–100	🟡 UNVERIFIED
Coldwater Canyon *	200,000–300,000	Unknown	200–300	🟡 UNVERIFIED
Benedict Canyon *	150,000–250,000	Unknown	150–250	🟡 UNVERIFIED
Other Valley Springs (30+) *	1,000,000–2,500,000	0	1,000–2,500	🔴 EXTINCT

Notes:

- † Historical estimates derived from documented miner's inch measurements in 1888 Hall report and 1890 Congressional testimony
- * Estimates extrapolated from comparable spring systems and historical descriptions
- 🟡 UNVERIFIED indicates springs may persist on private land but with no confirmed modern flow measurements
- Current status of 0 indicates complete depletion, burial, or diversion to storm drains

Total Freshwater Contribution Calculations

Metric	**Value**
Estimated Historical Total (Low)	**3,545,000 gallons/day**
Estimated Historical Total (High)	**7,572,000 gallons/day**
Estimated Historical Average	**~5,500,000 gallons/day**
Estimated Historical Annual Volume	**~2 billion gallons/year**
Current Confirmed Total (2026)	**25,000–56,000 gallons/day**
Decline from Historical Average	**~99% reduction**

The dramatic decline in spring-fed freshwater directly correlates with the 2011 SCCWRP finding that only 2% of Ballona Creek's current flow originates from underground springs, with 98% now consisting of urban runoff (irrigation excess, car washing, industrial discharge, and other anthropogenic sources).

Historical Overview

Pre-Contact Period (Before 1769)

The Tongva (Gabrielino) people inhabited the Los Angeles Basin for at least **8,000–10,000 years** before European contact. The Ballona Watershed's abundant spring systems supported multiple permanent villages, including Kuruvungna ("a place where we are in the sun") at what is now University High School, and Guashna/Sa'angna ("place of tar") at the mouth of Ballona Creek in present-day Playa Vista. The Tongva word for the Ballona estuary and wetlands was *Pwinukipar*, meaning "it is filled with water."

Archaeological evidence at Kuruvungna dates continuous occupation to at least the **5th century BC**, with the village site at Guashna (CA-LAN-62) showing occupation from approximately **8000 BC to 1600 AD**.

Spanish Colonial Period (1769–1821)

The Portolá Expedition of August 1769 camped at Kuruvungna Springs, where Father Juan Crespí documented the Tongva village and its flowing waters:

> "...as we arrived and set up camp, six very friendly, compliant tractable heathens came over, who had their little houses roofed with [tules]..."

Crespí named the site "San Gregorio" and noted that the flowing water reminded expedition members of Saint Monica's tears—a reference that later inspired the naming of Santa Monica. The springs were also called "El Berrendo" (the wounded deer), "Las Lágrimas de Santa Mónica" (Saint Monica's tears), and eventually "Serra Springs" after Junípero Serra.

The Los Angeles River Migration (1825)

A critical hydrological event shaped the watershed: between 1825–1828, a series of unprecedented floods caused the Los Angeles River to permanently shift its course southward to San Pedro Bay. Previously, the river had flowed through the Ballona watershed into Ballona Lagoon. Despite this dramatic change, the inland marshes did not dry up—freshwater springs flowing southwest from the Santa Monica Mountains continued to sustain the watershed's wetland complexes.

Mexican Rancho Period (1821–1848)

During the Mexican era, major land grants were organized around spring systems:

Rancho Name	**Grant Date**	**Acreage**	**Grantee**	**Water Source**
Rancho Aguaje de la Centinela	1837	~14,000	Various	Centinela Springs
Rancho Rodeo de las Aguas	1838	4,539	María Rita Valdez de Villa	Coldwater/Benedict Canyon
Rancho Las Ciénegas	1823	4,439	Francisco Avila	Baldwin Hills foothill springs
Rancho La Ciénega ó Paso de la Tijera	1843	4,219	Vicente Sánchez	Baldwin Hills springs
Rancho La Ballona	~1840s	14,000	Machado & Talamantes	Ballona Creek, valley springs

María Rita Valdez de Villa, an Afro-Latina widow and granddaughter of one of the original 1781 Los Angeles settlers, managed Rancho Rodeo de las Aguas as one of California's first female landowners.

American Period and Groundwater Depletion (1848–Present)

Following California statehood, rapid urbanization and groundwater extraction devastated the watershed's spring systems.

Colonel William Hammond Hall's 1888 Survey provides the most detailed historical documentation:

> "In several depressions or arroyos of the Santa Monica plain, and at the footing of that plain against the Centinela hills... there are a number of little water sources of the class called cienegas... A belt of these sources in the ranchos La Brea, Rodeo de los Aguas, and Santa Monica, is found one to three miles out from the mountain's base, and nearly half way down the plain."

The 1938 Warning: The History of Inglewood prophetically predicted the crisis:

> "...there is an ominous note in the predictions of those best informed in such matters, that there is daily being taken from the seemingly inexhaustible underground pools of water more than nature is putting back, and that someday there will be a reckoning."

By the 1930s, groundwater pumping had lowered water tables by 150+ feet, causing most springs to cease flowing. The Army Corps of Engineers channelized Ballona Creek in the 1930s–1940s, and most remaining springs were capped or diverted to storm drains.

Geographic Distribution of Springs

Geological Controls

The SCCWRP Historical Ecology Study identified a critical pattern: **springs clustered in the Santa Monica Mountain foothills and stopped abruptly at Franklin Canyon**. No springs were mapped east of this point.

Geological Explanation:

1. **Santa Monica Mountains Structure:** The mountains consist of "granite of volcanic origin, layered between worn river rocks and ocean-bottom mud," creating excellent aquifer conditions

2. **Fault Systems:** The Newport-Inglewood Fault system creates barriers and conduits for groundwater movement
3. **Permeability Changes:** East of Franklin Canyon, geological composition changes, reducing spring emergence
4. **Alluvial Fan:** The eastern watershed is dominated by the Los Angeles River's historical alluvial fan (well-drained coarse deposits), which absorbs water rather than forcing it to surface

Newport-Inglewood Fault Influence

The Newport-Inglewood Fault created the Baldwin Hills and controlled groundwater movement:

- **La Cienega wetlands** formed where the fault acted as a "barrier to groundwater movement," forcing water to surface
- **Centinela Springs** emerged along the uplift zone
- **Artesian conditions** in Inglewood area resulted from confined aquifers under pressure

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Detailed Spring Documentation

1. Kuruvungna Springs (University High School, West Los Angeles)

Attribute	Value
Tongva Name	Kuruvungna / Koruu'vanga
Meaning	"A place where we are in the sun"
Spanish Names	San Gregorio (1769), El Berrendo, Las Lágrimas de Santa Mónica, Serra Springs
Modern Location	University High School, 1439 S. Barrington Avenue, Los Angeles 90025
Coordinates	34° 2.702' N, 118° 27.465' W
CA Landmark	California Historical Landmark #522 (designated 1954)
Archaeological Site	CA-LAN-382
2026 Status	🟢 **ACTIVE**

Attribute	Value
Historical Flow	22,000–56,000 gallons/day (stable for millennia)
Current Flow	22,000–56,000 gallons/day
Flow Rate (GPM)	15–39 gallons per minute (0.03–0.09 cfs)

Hydrological Significance: Kuruvungna Springs is the **only major spring in the Ballona Watershed that remains actively flowing above ground** in 2026 with confirmed measurements. The springs emerge from two separate locations on the University High School campus:

1. **Main Spring Group:** In the protected area managed by the Gabrielino/Tongva Springs Foundation, includes an 80 sq ft lagoon
2. **Athletic Field Spring:** Feeds into a man-made waterfall at the northeastern edge of the upper athletic field
3. **Texas Avenue Spring (EXTINCT):** A third spring located farther north ceased flowing during the 1940s when a local water company began drawing from the aquifer

The measured flow of 22,000–56,000 gallons/day represents essentially **100% of the watershed's confirmed natural spring discharge**. Water from the springs drains into Santa Monica Bay via storm drain infrastructure.

Historical Note: In the late 1800s, Kuruvungna Springs served as the primary water supply for the City of Santa Monica. A 150-year-old Mexican cypress planted by the Portolá expedition still stands at the site. The springs have flowed continuously for at least 8,000 years of documented human occupation.

Public Access: Open first Saturday of each month, 10 AM–3 PM. Annual Indigenous Peoples' Day Festival in mid-October.

Website: https://gabrielinosprings.com/

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2. Centinela Springs (Inglewood)

Attribute	Value
Tongva Name	Not recorded (known to Indians "from ancient times")

Attribute	Value
Meaning	N/A
Spanish Name	Aguaje de la Centinela (Watering Place of the Sentinel)
Modern Location	Edward Vincent Jr. Park, 700 Warren Lane, Inglewood 90302
Coordinates	33° 58.464' N, 118° 20.558' W
CA Landmark	California Historical Landmark #363 (designated 1939, plaque 1970/1976)
Archaeological Site	Tongva artifacts found during 1930s amphitheater excavation
2026 Status	🔴 **EXTINCT**
Historical Flow	323,000–1,616,000 gallons/day (documented peak 1895)
Current Flow	0 gallons/day
Flow Rate (GPM)	Historic: 224–1,122 gallons per minute (0.5–2.5 cfs)

Hydrological Significance: Centinela Springs was once the **most productive documented spring system** in the Ballona Watershed. Historical records provide detailed flow measurements:

Year	Source	Flow (miner's inches)	Flow (gal/day)
1888	Hall Report (natural)	20–30	323,000–485,000
1888	Hall Report (developed)	50+	808,000+
1890	U.S. Congressional Report	N/A	900,000 (capacity)
1895	Freeman well development	100	1,616,000

The springs fed Centinela Creek, which flowed 4 miles northwest to join Ballona Creek at present-day Playa Vista. Unlike seasonal Ballona Creek, Centinela Creek was spring-fed and thus "a more reliable source of freshwater."

Historical Water Use:

> "Water was once diverted from the runoff of Centinela Springs, from the big draw, along Grevillea Street, as far as Olive Street and thence to Oak Street. The canal was lined with willows, and the stream was used to water sheep."

Depletion Timeline:

Year	Water Table Depth	Notes
Pre-1870	Surface (artesian)	Springs gushed as "veritable cascade"
1936	~150 feet	Groundwater pumping effects visible
1938	~160 feet	Dropping 4 feet per year
1949	N/A	Inglewood joined Metropolitan Water District
2026	N/A	Existing wells too shallow to reach aquifer

The springs have been **completely extinct for over 75 years**. The 2011 SCCWRP field survey did not identify any active springs in the Centinela area.

Monument: Two historical markers at site—1939 Archibald Garner design and 1970/1976 state plaque.

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3. Rodeo de las Aguas Springs (Beverly Hills)

Attribute	Value
Tongva Name	El Rodeo de las Aguas (adopted into Spanish)

Attribute	Value
Meaning	"The Gathering of Waters" (sacred Tongva site)
Spanish Name	El Rodeo de las Aguas
Modern Location	Beverly Drive & Sunset Boulevard (Beverly Hills Hotel site)
Coordinates	Approximately 34° 4.7' N, 118° 24.8' W
CA Landmark	None (Electric Fountain memorial at Wilshire & Santa Monica Blvds features Tongva figure)
Archaeological Site	Not formally designated
2026 Status	🔴 **EXTINCT / BURIED**
Historical Flow	500,000–1,500,000 gallons/day (estimated)
Current Flow	0 gallons/day (channelized underground)
Flow Rate (GPM)	Historic: ~350–1,040 gallons per minute (estimated)

Hydrological Significance: Rodeo de las Aguas ("Gathering of Waters") was the confluence point for multiple canyon streams descending from the Santa Monica Mountains:

- **Cañada de las Aguas Frías** (Coldwater Canyon) — "Glen of the Cold Waters"
- **Cañada de los Encinos** (Benedict Canyon) — "Glen of the Green Oaks"
- **Franklin Canyon Creek**

The combined streams emerged from underground at the present site of the Beverly Hills Hotel. The rancho was described as having "an extremely unique micro climate where plants and livestock thrived" due to the water abundance.

Water Infrastructure (1880s): Property owners Hammel and Denker had "a tunnel bored into the mountains to tap springs" in Coldwater Canyon, demonstrating early groundwater engineering.

Development History: Hydraulic engineers circa 1913 determined the aquifer had sufficient capacity for 30,000 residents. After oil drilling failed in the early 1900s, the abundant groundwater enabled Burton Green to develop Beverly Hills. The Rodeo Land and Water Company was formed in 1906, and the Beverly Hills Hotel was built in 1912 at the historic

confluence. The canyon streams were progressively channelized underground during 20th-century development.

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4. Santa Monica Mountain Foothill Springs (Coldwater, Benedict, Franklin Canyons)

Attribute	Value
Location	Beverly Hills foothills to Franklin Canyon
Historical Count	~32 springs (70% of watershed total)
Historical Flow	~3.4 million gallons/day combined
2026 Status	🟡 **UNVERIFIED** — some may persist on private property
Current Flow	Unknown — no confirmed measurements

Distribution Pattern: The SCCWRP study found springs "clustered in the foothills and stopped abruptly at Franklin Canyon. This distribution could be the result of fault displacement or geologic composition."

Franklin Canyon: The easternmost springs in the cluster. Franklin Canyon Park preserves Franklin Lake, which may still receive some spring contribution. The park is publicly accessible.

Coldwater Canyon: Historical tunnel development in the 1880s documented substantial spring resources. Water sheets reportedly still flow across canyon roads—"typically from springs rather than landscape irrigation runoff." Flow estimates of 100,000–150,000 gal/day are unverified.

Benedict Canyon: Same geological formation as neighboring canyons. Springs may persist on private residential properties but are not accessible for inspection.

Note: While some foothill springs may still flow, there are no confirmed modern flow measurements. Claims of 1+ million gallons/day current flow from foothill springs require verification.

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5. La Cienega Springs Complex (Mid-City to South Los Angeles)

Attribute	Value
Tongva Name	Not recorded
Meaning	N/A
Spanish Name	La Ciénega / Las Ciénegas (The Swamp/Marsh)
Modern Location	Depression from Mid-City Los Angeles to South Los Angeles
Coordinates	Centered approximately 34° 1.7' N, 118° 22.3' W
CA Landmark	None
Archaeological Site	Multiple sites within historic wetland boundary
2026 Status	🔴 **EXTINCT / DRAINED / DEVELOPED**
Historical Flow	500,000–1,000,000 gallons/day (estimated)
Current Flow	0 gallons/day (surface); subsurface flow may persist
Flow Rate (GPM)	Historic: ~350–700 gallons per minute (estimated)

Hydrological Significance: La Cienega ("The Swamp") was the **second-largest wetland complex** in the watershed after Ballona Lagoon. The 1888 Hall report described "a little stream from the east, draining the springs of the ranchos La Cienega and Paso de la Tejera." The complex included:

- Meadows, ponds, marshes, and pools stretching from Mid-City to South Los Angeles
- A large pond near present-day Florence Avenue and Normandie Avenue intersection
- Alkali meadows and alkali flats (35% and 8% of watershed wetlands respectively)
- **174 unique wetland features** across the watershed

The Newport-Inglewood Fault served as a "barrier to groundwater movement," forcing water to surface and creating the vast wetland complex.

Land Grants: Rancho Las Ciénegas (1823, 4,439 acres) and Rancho La Ciénega ó Paso de la Tijera (1843, 4,219 acres) were both named for these spring-fed wetlands.

Current Status: The vast La Cienega wetlands were developed primarily for oil extraction (discovered 1916) and urban development. Kenneth Hahn State Regional Park preserves some remaining open lands. Springs likely persist underground but are no longer visible at the surface.

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6. La Brea Springs (Miracle Mile Area)

Attribute	Value
Tongva Name	Not recorded (site used for asphaltum harvesting)
Meaning	N/A
Spanish Name	La Brea (The Tar)
Modern Location	Rancho La Brea area, near present-day La Brea Tar Pits
Coordinates	Approximately 34° 3.8' N, 118° 21.3' W
CA Landmark	None (La Brea Tar Pits is a separate landmark)
2026 Status	🔴 **EXTINCT / DEVELOPED**
Historical Flow	200,000–400,000 gallons/day (estimated)
Current Flow	0 gallons/day
Flow Rate (GPM)	Historic: ~140–280 gallons per minute (estimated)

Hydrological Significance: The 1888 Hall report identified La Brea Springs as part of the "central springs of the upper belt—on ranchos La Brea and Rodeo de las Aguas—[where] Ballona gathers its upper perennial waters." Fresh water springs coexisted with the famous tar seeps; the Tongva harvested asphaltum (natural tar) for waterproofing their te'aat (plank canoes) while using spring water at the same location.

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7. UCLA Mildred E. Mathias Botanical Garden Arroyo (Westwood)

Attribute	Value
Tongva Name	Part of Tovaangar (Tongva homeland)
Meaning	N/A
Spanish Name	N/A (part of general "Westwood arroyo" system)
Modern Location	707 Tiverton Drive, UCLA Campus, Los Angeles 90095
Coordinates	34° 3.996' N, 118° 26.508' W
CA Landmark	None
2026 Status	🟡 **MODIFIED**
Historical Flow	10,000–20,000 gallons/day (estimated)
Current Flow	Artificial recirculating stream (natural contribution <5,000 gal/day)

Historical Development:

- **1929:** UCLA established, preserving 7.5-acre natural arroyo with native willows and coastal scrub
- **1950s:** Minimal irrigation system installed
- **1970s:** Recycling stream and ponds constructed
- **Pre-2024:** Stream system losing "200 swimming pools worth of water each year" through seepage

2022–2024 Waterworks Project: A $1.5 million renovation funded by Charlie and Peggy Norris transformed the water system with:

- Impermeable base to prevent water loss
- New hydrology system using **reclaimed water**
- Waterfall feature and wetland garden
- Individualized water delivery to garden sections

Current Status: The garden's water system is now water-efficient and sustainable, using reclaimed water rather than relying on natural spring flow. A Tongva Basket Weaving Garden has been established on the grounds.

Note: This site represents a natural drainage feature within the Ballona Watershed rather than a documented indigenous spring. It is included because the preserved riparian vegetation suggests historical groundwater contribution.

Website: https://www.botgard.ucla.edu/
Access: Free and open daily (only free public botanical garden in Greater Los Angeles)

Associated Tongva Village Sites

Kuruvungna Village

- **Location:** At Kuruvungna Springs (present-day University High School)
- **Occupation:** Continuously occupied for at least **8,000 years**
- **Description:** Thriving village with tule-thatched houses (kiiys). The Portolá Expedition of August 1769 documented the village and received gifts of watercress, chia (pashí), and fresh spring water from residents.

Guashna / Sa'angna Village

- **Location:** Mouth of Ballona Creek, present-day Playa Vista (Lincoln Boulevard & Jefferson Boulevard area)
- **Archaeological Site:** CA-LAN-62
- **Meaning:** "Place of tar"
- **Occupation:** Approximately **8000 BC to 1600 AD** (nearly 10,000 years)
- **Description:** Major coastal village approximately 1,500 feet in length with population estimated at 100+ people. Fed by freshwater from Centinela Creek (originating at Centinela Springs). Over 400 Tongva burials were discovered during Playa Vista development.
- **2023 Marker:** Historical marker installed by Friends of Ballona Wetlands, California Fish & Wildlife, and Gabrielino Tongva Indians of California.

Contemporary Tongva Connection

The Gabrielino/Tongva Springs Foundation maintains cultural continuity at Kuruvungna under a 21-year lease from LAUSD for $1 annually. As Angie Dorame Behrns (San Gabriel Band of Mission Indians) states:

> "Los Angeles is Indian land. It is Indian Country. We are the Gabrieleno-Tongva from the San Gabriel Mission, and we are still here."
>
> "The springs are here as just another reminder of how strong our tribe was and still is. It speaks to the perseverance of the tribe and the cultural continuity."

Watershed Statistics and Modern Conditions

Parameter	Value
Watershed Area	~130 square miles (337 km²)
Historical Wetlands	**14,149 acres**
Historical Wetland Features	**174 unique features** (ponds, marshes, wet meadows)
Springs Mapped (Pre-Development)	**45 documented**
Springs in Foothills	**32 (70%)**
Springs in Valley/Other	**13 (30%)**
Springs Actively Flowing (2026)	**1 confirmed** (Kuruvungna)
Spring-Fed Water (2011 Study)	**~2%** of creek flow
Urban Runoff (2011 Study)	**~98%** of creek flow
Impervious Surface Coverage	**~35%** of watershed (vs. <5% pre-1900)
Historical Spring Contribution	**~3.5–7.5 million gallons/day**
Current Spring Contribution	**~25,000–56,000 gallons/day**

Hydrological Transformation

The dramatic decline in spring-fed freshwater reflects the fundamental hydrological transformation of the Ballona Watershed during the 20th century:

Groundwater Overdraft: Intensive pumping for municipal water supply lowered water tables by 150+ feet in many areas, eliminating the hydraulic pressure that fed artesian springs. The West Basin communities of Inglewood and Long Beach began tapping artesian wells and springs along the Newport-Inglewood Uplift around 1870.

Reduced Recharge: Urbanization increased impervious surfaces from <5% (pre-1900) to ~35% (2010), dramatically reducing infiltration. Storm drain systems intercept and redirect surface water that would naturally recharge aquifers.

Stream Channelization: The Army Corps of Engineers "straightened it, and made its course permanent by paving the sides of Ballona Creek in 1935" to prevent flooding. This eliminated the natural channel's ability to recharge groundwater and receive spring contributions.

Spring Burial: Many springs were physically capped or diverted directly to storm drains. Old storm drain maps sometimes show "spring relief" areas where capped springs discharge underground.

Subsurface Flow Pattern: Historical accounts repeatedly note streams "sinking" into porous soils: "Across the valley floor most of the streams sank into porous soils or spread into the major wetland complexes." This explains why the watershed had relatively few perennial surface streams despite abundant water—much flow occurred underground.

Publicly Accessible Spring Sites (2026)

Kuruvungna Springs / Tongva Sacred Springs

- **Address:** 1439 South Barrington Avenue, Los Angeles, CA 90025 (University High School campus)
- **Access:** First Saturday of each month, 10 AM–3 PM
- **Cost:** Free
- **Contact:** Gabrielino/Tongva Springs Foundation
- **Website:** https://gabrielinosprings.com
- **Special Events:** Indigenous Peoples' Day Festival (mid-October annually)

Franklin Canyon Park

- **Address:** 2600 Franklin Canyon Drive, Beverly Hills, CA 90210
- **Access:** Daily during park hours
- **Features:** Franklin Lake (possibly spring-fed), hiking trails
- **Managed by:** Santa Monica Mountains Conservancy
- **Cost:** Free

UCLA Mildred E. Mathias Botanical Garden

- **Address:** UCLA Campus, southeastern corner
- **Access:** Open daily
- **Features:** Reclaimed water stream system, historical arroyo site, Tongva Basket Weaving Garden
- **Cost:** Free (only free public botanical garden in Greater LA)
- **Website:** https://www.botgard.ucla.edu/

References and Sources

Primary Historical Sources

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- Rosenberg, J.L. *The Romance of Centinela Springs* (historical pageant). Inglewood, 1931–1938.
- U.S. Congress. *Report on Irrigation*. 1890 (documented Centinela Springs capacity).
- Crespí, Juan. Unpublished diary of the Portolá Expedition, 1769. Huntington Library Collections.
- *History of Inglewood*. City of Inglewood Historical Records, 1938.
- Lee, W.T. *Geologic Reconnaissance of a Part of Western Arizona*. USGS Bulletin 352, 1912.

Scientific Reports

- Stein, E.D., Dark, S., Longcore, T., Grossinger, R., Hall, N., & Beland, M. *Historical Ecology of the Ballona Creek Watershed*. Southern California Coastal Water Research Project, Technical Report 671, 2011. https://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/671_BallonaHistoricalEcology.pdf

- Liu, S., Hogue, T., Stein, E.D., & Barco, J. *Contemporary and Historical Hydrologic Analysis of the Ballona Creek Watershed*. Southern California Coastal Water Research Project, Technical Report 683, 2011. https://cms.santamonicabay.org/wp-content/uploads/2015/11/Ballona-Water-Balance_2011_FINAL2.pdf

- LA County Department of Public Works. *Ballona Creek Watershed Management Plan*. 2004. https://dpw.lacounty.gov/wmd/watershed/bc/

California Historical Landmarks

- California Historical Landmark #522: Tongva Sacred Springs (Kuruvungna), designated 1954.
- California Historical Landmark #363: Centinela Springs (Aguaje de la Centinela), designated 1939.

Organizations and Online Resources

- Gabrielino/Tongva Springs Foundation: https://gabrielinosprings.com/
- Friends of Ballona Wetlands: https://www.ballonafriends.org/
- UCLA Mapping Indigenous LA: https://mila.ss.ucla.edu/
- Historical Society of Centinela Valley
- Beverly Hills Historical Society: https://www.beverlyhillshistoricalsociety.org/

- Santa Monica Conservancy: https://smconservancy.org/
- UCLA Mildred E. Mathias Botanical Garden: https://www.botgard.ucla.edu/
- Santa Monica Mountains Conservancy (Franklin Canyon)

Academic Sources

- LMU Gabrielino-Tongva Bibliography: https://lmu.pressbooks.pub/gabrielinotongvabibliography/
- Altschul, Jeffrey H., et al. *Life in the Ballona: Archaeological Investigations at the Admiralty Site (CA-LAn-47)*. Statistical Research Technical Series 33, 1992.

News Sources

- "Sacred springs flowing through Los Angeles' University High School are testament to perseverance of Gabrieleno-Tongva." ABC7 Los Angeles, November 18, 2025.
- "The Secret Sacred Spring in West L.A." Alta Journal, March 29, 2020.
- "South Bay history: Centinela Springs attracted early settlers to Inglewood area." Daily Breeze, January 2, 2023.
- "Kuruvunga Spring: right from the source." The Loop Newspaper, February 17, 2024.

Document prepared January 2026. Flow rate conversions use the California standard: 1 miner's inch = 11.22 US gallons per minute = 16,157 gallons per day.

This report corrects significant errors in other published accounts, particularly regarding Centinela Springs historical flow rates (documented at 323,000–1,616,000 gal/day, not 50,000–100,000 gal/day as sometimes reported) and current spring status (definitively extinct since the 1930s–1940s, not "unknown").